

CLAIMS

We claim:

1. A method of securely displaying visual data comprising the steps of:
 - a. encrypting the visual data, whereby encrypted visual data is formed;
 - b. transporting the encrypted visual data to a display apparatus;
 - c. decrypting the encrypted visual data within the display apparatus such that an electronic version of the visual data is maintained within circuit elements that are substantially inaccessible; and
 - d. displaying the visual data as a visual image.
2. The method of claim 1 wherein the circuit elements comprise integrated circuit elements.
3. The method of claim 2 wherein the integrated circuit elements comprise a display circuit and a diffractive light valve, the diffractive light valve displaying the visual image.
4. The method of claim 3 wherein the diffractive light valve comprises a grating light valve.
5. The method of claim 4 wherein the integrated circuit elements comprise portions of a single integrated circuit.
6. The method of claim 4:
 - a. wherein the integrated circuit elements comprise individual integrated circuits; and
 - b. further comprising the steps of encoding and decoding the visual data in order to transfer the visual data between the individual integrated circuits.

- 1 7. The method of claim 4 wherein the display circuit comprises a driver
2 circuit for driving the grating light valve.
- 1 8. The method of claim 4 wherein the step of displaying the visual data
2 comprises scanning a line image over a display screen such that the visual image
3 has low persistence.
- 1 9. The method of claim 4 wherein the integrated circuit elements comprise a
2 decryption circuit.
- 1 10. The method of claim 4 wherein the step of transporting the encrypted
2 visual data comprises electronic transmission.
- 1 11. The method of claim 10 wherein the electronic transmission is selected
2 from the group consisting of satellite transmission, optical fiber transmission, and
3 internet transmission.
- 1 12. The method of claim 4 wherein the step of transporting the encrypted
2 visual data comprises recording the encrypted visual data on a storage media and
3 physically transporting the storage media.
- 1 13. The method of claim 12 wherein the storage media comprises a standard
2 storage media.
- 1 14. The method of claim 12 wherein the storage media comprises a non-
2 standard storage media.
- 1 15. The method of claim 1:
2 a. wherein the step of encrypting the visual data comprises uses a
3 public key; and
4 b. further comprising the step of generating the public key and a
5 private key, the private key residing within the display apparatus.

1 16. The method of claim 15 wherein the step of generating the public key and
2 the private key takes place within the display apparatus.

1 17. The method of claim 15
2 a. wherein the step of generating the public key and the private key
3 takes place outside of the display apparatus; and
4 b. further comprising the step of inputting the private key to the
5 display apparatus in such a manner that human access to the private key is
6 substantially unavailable.

1 18. The method of claim 1 wherein the step of encrypting the visual data
2 includes using a secret key and further wherein the step of decrypting the
3 encrypted visual data includes using the secret key.

1 19. A system for securely transmitting and displaying visual data comprising:
2 a. an encryption apparatus for encrypting the visual data, whereby
3 encrypted visual data is formed;
4 b. means for transporting the encrypted visual data from the
5 encryption apparatus to a display facility; and
6 c. a display apparatus located at the display facility that receives the
7 encrypted visual data, the display apparatus decrypting the encrypted
8 visual data such that an electronic version of the visual data is maintained
9 within circuit elements that are substantially inaccessible, the display
10 apparatus displaying the visual data as a visual image.

1 20. The system of claim 19 wherein the circuit elements comprise integrated
2 circuit elements.

1 21. The system of claim 20 wherein the integrated circuit elements comprise a
2 display circuit and further wherein the display circuit comprises a diffractive light
3 valve for displaying the visual image.

1 22. The system of claim 21 wherein the light valve comprises a grating light
2 valve.

1 23. The system of claim 22 wherein the integrated circuit elements comprise
2 portions of a single integrated circuit.

1 24. The system of claim 22 wherein the integrated circuit elements comprise
2 individual integrated circuits and further wherein the integrated circuit elements
3 encode and decode the visual data to transfer the visual data between the
4 individual integrated circuits.

1 25. The system of claim 22 wherein the display apparatus includes a scanning
2 device for scanning a linear image over a display screen such that the visual image
3 has low persistence.

1 26. The system of claim 22 wherein the means for transporting the encrypted
2 visual data includes means for electronic transmission.

1 27. The system of claim 26 wherein the means for electronic transmission is
2 selected from the group consisting of satellite transmission, optical fiber
3 transmission, and internet transmission.

1 28. The system of claim 22 wherein the means for transporting the encrypted
2 visual data includes a storage media, the storage media holding the encrypted
3 visual data during transport of the storage media.

1 29. The system of claim 28 wherein the storage media comprises a standard
2 storage media.

1 30. The system of claim 28 wherein the storage media comprises a non-
2 standard storage media.

1 31. The system of claim 19 wherein the encryption apparatus uses a public key
2 for encrypting the visual data and further wherein the display apparatus uses a
3 private key for decrypting the visual data, the private key residing within the
4 display apparatus.

1 32. The system of claim 31 wherein the display apparatus generates the public
2 key and the private key.

1 33. The system of claim 31 wherein the public key and the private key have
2 been generated outside of the display apparatus and further wherein the private
3 key has been generated and input to the display apparatus in such a manner that
4 human access to the private key is substantially unavailable.

1 34. The system of claim 19 wherein the encryption apparatus uses a secret key
2 for encrypting the visual data and further wherein the display apparatus uses the
3 secret key for decrypting the visual data.

1 35. A display apparatus for displaying encrypted visual data comprising circuit
2 elements that are substantially inaccessible, the circuit elements comprising a
3 decryption circuit for decrypting the encrypted visual data, whereby visual data is
4 formed, the circuit elements comprising a display circuit for displaying the visual
5 data as a visual image, such that an electronic version of the visual data is
6 maintained within the circuit elements.

1 36. The display apparatus of claim 35 wherein the display circuit comprises a
2 diffractive light valve for displaying the visual image.

1 37. The display apparatus of claim 36 wherein the diffractive light valve is a
2 grating light valve.

1 38. A display apparatus for displaying encrypted visual data comprising:

- 2 a. a decryption circuit for decrypting the encrypted visual data,
- 3 whereby visual data is formed; and
- 4 b. a grating light valve for displaying the visual data as a visual
- 5 image.